

# Burden of Malaria and Health Service Utilization in a Tribal Community of West Bengal State, India

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**Abstract** There is an urgent need for updating key socio-economic-cultural indicators and scientific understanding on Malaria for suitable control strategies among tribal populations. The study was conducted to find risk correlates of Malaria among tribal groups. A community based analytical cross-sectional study was done among tribals of a district of West Bengal in eastern India by interview technique using standardized tool. The study participants were predominantly males (81.50% ), between 45-60 years (65.87%), one in ten had no formal education; more than half of them were associated with agriculture. One fourth of the participants reported their source of knowledge on Malaria from Newspaper/ Radio/ TV while one fourths became knowledgeable while suffering from Malaria. Majority recognized mosquito bite as basic issue (71.63%), bite at night (96.64%), breed in stagnant water (79.57%). Yet, only one fourth correctly responded that mosquitoes, after biting a Malaria patient, can transmit the disease;. Half of them identified common malarial symptom of fever with shivering and indoor dark resting place of mosquitoes during daytime. Malaria is caused by *Plasmodium* parasite was correctly known to very few (1.44%). Regarding health seeking behaviour, 40.63% preferred hospital treatment; still disease condition was deciding factor to seek formal care by 95.67%; incidentally their expectation of treatment was limited to chloroquine (84.62). Bed nets was practiced as the commonest protective method followed by draining of stagnant water. Among users using bed nets only 85(70.83%) reported using Insecticide treated nets. The present study findings could provide baseline information to design effective and sustainable Malaria control strategies suited to local conditions in the near future as unsatisfactory knowledge about Malaria among the tribals is significant risk.

**Keywords:** attitudes, knowledge, malaria, practices, tribals

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## 1. Introduction

More than 100 countries worldwide are known as malaria endemic zone . 216 million cases of Malaria were reported in 2010 globally. Malaria is major public health problem in tribal areas with a big contributor to morbidity and mortality [1]. In India the estimated malaria cases were 1.31 million with 753 deaths in the year 2011; more than half were infected with *Plasmodium falciparum* [2]. However, actual number may be more due to underreporting from private health care providers [2]. There is a significant difference in the nature of Malaria burden in tribal areas. Tribal areas are mostly endemic areas and secondly, the proportion of severe Malaria in this burden is extremely high. It has huge implication for the tribal economy and wellbeing of these communities and put further pressure on the already economically weak tribal families. There are four basic factors responsible for higher burden of Malaria in tribal areas-environmental factor, malnutrition, poor access to health services and development projects. Malaria protective measures are

related to knowledge and beliefs of people; when they think Malaria risk is low, it is more difficult to implement protective measures [3]. The vulnerable segment of the population are worst affected due to above reasons [4]. Studies on knowledge, attitudes and practices are becoming more important to design and improve Malaria control activities, to establish epidemiological and behavioural baselines and to identify indicators for monitoring programs [5]. Perceptions, beliefs, and attitudes about malaria causation, symptom identification, treatment of malaria, and prevention are often overlooked in malaria control efforts. The purpose of this study was to understand these issues related to the knowledge and health seeking behaviour for Malaria among tribals which can be an important step towards developing strategies with implications for control.

## 2. Methodology

### 2.1. Study Design

A community based analytic cross sectional study was conducted from between January and March 2014 on the

census tribal population residing permanently in the field practice area of Department of Community Medicine, College of Medicine and JNM Hospital, Kalyani, West Bengal.

## 2.2. Study Instrument

The pretested questionnaire interview schedule was developed incorporating to find out relation to malaria with the socio demographic situation prevailing in India that was tailor-made by repeated pilot study including socio-demographic correlates like adult residents' knowledge and perceptions about Malaria transmission, cause, and treatment seeking patterns, preventive measures and practices. To minimize bias information and variables the questionnaire prepared in English language was translated into native local language 'Amharic' to make it understandable and to administer by interviewers and interviewees.

## 2.3. Data Collection Procedure

Study was approved by Institutional ethics committee. All the participants were individually counseled by the health workers and asked to provide informed consent. They were assured that the information collected will be earmarked only for research purpose. The principal investigator trained the data collection team and supervised the data collection. The structured questionnaire was administered by trained field workers by conducting house-to-house visits in 416 tribal households. The heads of household was interviewed or in their absence one adult person per household was interviewed; on an average an hour per participant was required for acquisition of concluding data and five to six persons could be covered up per day. The data were strictly kept confidential and were not disclosed for the assessment, management or intervention. The concept of disease dynamics of Malaria was discussed in several sessions in connection with feedback to the study.

## 2.4. Statistical Analysis

The data were collected and entered into MS Excel spreadsheets for analysis. Epidemiological variables were analyzed using Graph Pad In Stat "version 3" software with an alpha error of five percent.

## 3. Results

Among 416 respondents a great majority were males (81.50 %), between 45-60 years (65.87%) 10.57 percent of had no formal education; 55.53 percent were associated with agriculture [Table 1].

Of the respondents 152 (36.54%) heard about Malaria from print and electronic media; 106(25.48%) knew Malaria after they suffered from it. Majority of them, 71.63 percent reported mosquito bite as cause of Malaria, yet only 26.92 percent could correctly respond that mosquitoes, after biting a Malaria infected patient, can only transmit disease. Shivering as a common symptom of Malaria was known to half (50.96%) of them [Table 2].

Almost everyone (96.64%) knew that mosquito prefer night time biting time while stagnant water as breeding

place by 79.57 percent, and resting place in the indoor dark area during day time by 53.37 percent [Table 2].

**Table 1. Socio demographic Characteristics of The Tribal Respondents (n=416)**

Variables	Frequency
Gender	
Male	339(81.50)
female	77(18.50)
Age	
20-45	30(7.21)
45-60	274(65.87)
>60	112(26.92)
Religion	
Hindu	386(92.79)
Muslims	30(7.21)
Educational status	
Illiterate	44(10.57)
Primary	256(61.55)
Secondary	52(12.50)
Higher secondary	36(8.65)
Graduate	28(6.73)
Main occupation	
Farmers	231(55.53)
Business	69(16.59)
Employed	43(10.33)
Housewife	58(13.94)
Unemployed	15(3.61)

**Table 2. Knowledge of Tribal Respondents on Malaria Transmission, Mosquito Behaviour and Prevention**

Variables	Frequency
Source of information (n=416)	
Home /Neighbors	31(7.45)
Radio /TV/newspapers	152(36.54)
Hospitals /dispensaries	112(26.92)
Health workers	15(3.61)
I suffered from Malaria	106(25.48)
Mode of transmission (n=416)	
By bites of any mosquito	286 (68.75)
By bites of mosquito which has bitten a Malaria patient	112(26.92)
Others (stagnant water, unclean environment, climate, other illness)	15(3.61)
Do not know	3 (0.72)
Causes of Malaria (n=416)	
Germes	15(3.61)
Dirt/stagnant water	93(22.36)
Mosquito bites	298(71.63)
Plasmodium organisms	6(1.44)
Do not know	4(0.96)
Symptoms of Malaria(n=416)	
Fever with shivering	212(50.96)
Fever with intervals	176(42.31)
Vomiting	8(1.92)
Weakness	12(2.88)
Do not know	8(1.93)
Mosquito breeding areas(n=416)	
Stagnant water	331(79.57)
Tall grasses	76(18.27)
Bushes	7(1.68)
Others (latrine, cattle shed)	2(0.48)
Biting time(n=416)	
During night time	402(96.64)
During day time	8(1.92)
Any time	6(1.44)
Do not know	0(0)
Resting places	
Dark place inside the house during day	222(53.37)
Dirty areas	147(35.34)
Edge of the river/stagnant water/ponds	41(9.85)
Do not know	4(0.96)
Others (latrine, cattle shed)	2(0.48)

If family members had fever, visiting hospital was preferred was preferred 40.63 percent followed by taking

help of traditional healers (36.78%) and drug shop (21.87%).

The most important factor was condition of family member when deciding to seek formal care with fever by 398 (95.67%) followed by perceived cost by 18 (4.33%). To their horizon of knowledge by most (84.62), the antimalarial therapy was limited to chloroquine. Bed nets was commonest protective method practiced by 120(28.85%); among them 85(70.83%) were using insecticide treated and 35(29.17%) untreated nets. Second most predominant preventive measure in practice was draining of stagnant water 125(30.04). In practice, 17(4.09) participants in our study reported home treatment with anti Malarial [Table 3 and Table 4].

**Table 3. Attitudes of Tribal Respondents on Malaria and Its Control**

Variables	Frequency
Attitude	
If a person had fever, first action would be (n=416)	
Traditional healer	153 (36.78)
Self treatment at home	3 (0.72)
Go to a hospital	169(40.63)
Go to drug shop	91(21.87)
Do nothing	0(0)
Most important factor when deciding to seek formal care for person with fever (n=416)	
Condition of person	398 (95.67)
Perceived cost	18 (4.33)
Time of day sickness started	0(0)
Best treatment for Malaria (n=416)	
Chloroquine	352 (84.62)
Primaquine	1(0.24)
ACT	2(0.48)
Paracetamol	55(13.22)
Others	6(1.44)
Volunteer to treated or untreated bed nets (n=416)	
Yes	355(85.34)
No	61(14.66)

**Table 4. Practices of Tribal Respondents on Malaria and Its Control**

Variables	Frequency
Treatment (n=416)	
Home treatment with antimalarials	17(4.09)
Correct dose according to doctor	212(50.96)
Gives full course of medicine	187(44.95)
Mosquito preventive measures in practice(n=416)	
Use mosquito bed net	120(28.85)
No use mosquito (bed) net	10 (2.40)
Untreated bed net (n=120)	85(70.83)
Treated bed net (n=120)	35(29.17)
Window net	27(6.49)
Clean surroundings	24(5.77)
Draining of stagnant water	125(30.04)
Use insecticide spray	12(2.88)
Mosquito coil	84(20.19)
Smoke cow dung and/or leaves	4(0.96)
Use DDT (indoor residual spray)	4(0.96)
Close windows and doors	6(1.44)
Take no measure (do nothing)	0(0)

## 4. Discussions

This study sheds light on Malaria in tribals of Kalyani regarding the level of understanding community knowledge, attitude and practice about Malaria and health seeking behavior. It provides information for educators and policy makers that are necessary for guidance towards tribal Malaria preventive campaigns.

Our study revealed that Malaria was known disease that was supported in literature [6,7,8].

Among the respondents in our study only 112(26.92%) respondents correctly about malaria transmission.

The respondents' level of awareness about mode of Malaria higher than some studies reported from Africa [9,10], though lower than studies reported from Malawi (55%) [11], Turkey (67%) [12], and other Ethiopian studies (93%) [13,14].

Even though staying in malaria endemic area, general mass of people in India and other tropical countries were unaware of the disease epidemiology [14,15,16,17,18].

Knowledge of vector bionomics is of utmost importance for vector borne disease control measures that was relatively high among participants of the present study viz. 79.57 percent indicated that stagnant water bodies serving as potential mosquito breeding sites. Previous studies in Ethiopia have also confirmed similar findings [10, 14].

Pyrexia with shivering was known as common malarial symptom among respondents in our study that was supported by findings from other parts of world [7,19].

In absence of tailor-made educational programs in Nigeria, the inappropriate awareness and outlook among indigenous people there were insufficient practices on the precautionary measures were leading to control malarial transmission. [20].

Although local drug shops, whose aptitude was uncertain, were not the popular treatment source (21.87%) in our study, yet they were alternatives to get initial treatment for perceived malaria. This over the counter drug prescription has been ignored in general across globe [21].

Researchers from north-India noted that increasing the level of perception of the community about malaria is of paramount importance to halt this avoidable illness [22].

A projected half of world inhabitants are at risk of malaria as an unique among diseases with its roots lie deep within human communities. Therefore understandings of the local paradigms are of supreme importance for the execution of socially apposite, justifiable, and operationally feasible options [23,24,25].

## 5. Conclusion

Majority of the study participants had adequate knowledge and ample enviable health seeking behaviour on Malaria. However, we have to overcome these major socio-demographic barriers to implement effective as well sustainable programs in the poor as well as anthropologically- diverse tribal peoples. Therefore, there is a re-orientation for future constructive outcome. We strongly feel that solution of malaria control lies on scientific expansion of primary care at the doorsteps of the grass root population tribal communities. The result of this study will augment the existing knowledge, so that the policy makers can formulate optimum strategies in public health advocacy scenarios.

## 6. Strengths of the Study

The strength of the study is that we could throw light on the societal risk correlates on re-emerging health issues to save the aborigines from preventable illness like malaria in the eastern part of India.

## 7. Limitations of the Study

Our study had several limitations as we could not include all the known risk factors related to Malaria like, knowledge about National Vector Borne Disease Control Program with advocacy of integrated vector management, role of daytime biting mosquitoes in spreading other diseases, concept of 'dry day', probability of death in Malaria.

## 8. Future Directions of the Study

In the next phase of our study we hope to conduct a multicentric study with added variables and hope to include tribal people from other parts of West Bengal.

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## Declaration of Conflicting Interests

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